Abstract: Sensitivity to unmeasured confounding is not typically a primary consideration in designing treated-control comparisons in observational studies. We introduce a framework allowing researchers to optimize robustness to omitted variable bias at the design stage using a measure called design sensitivity. Design sensitivity, which describes the asymptotic power of a sensitivity analysis, allows transparent assessment of the impact of different estimation strategies on sensitivity. We apply this general framework to two commonly-used sensitivity models, the marginal sensitivity model and the variance-based sensitivity model. By comparing design sensitivities, we interrogate how key features of weighted designs, including choices about trimming of weights and model augmentation, impact robustness to unmeasured confounding, and how these impacts may differ for the two different sensitivity models. We illustrate the proposed framework on a study examining drivers of support for the 2016 Colombian peace agreement.

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